Exhibit A

(Ex Parte Filing November 15, 2019 – ET NPRM 18-295)

Examples of Why Randomly Distributed Unlicensed LPI and VLP Devices Will Cause Harmful and Catastrophic Interference

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Examples of Harmful & Catastrophic Interference Caused by a Low Power Indoor (LPI) Device

	B		C	D	E	F
1	LPI Unlicensed Device					
2	151120190		Victim's Main Lobe Interference		Victim's Back Lobe Interference	
3	Typical Values					
4			Harmful	Catastrophic	Harmful	Catastrophic
5	Freq	GHz	6.1	6.1	6.1	6.1
6						
7	Modulation	QAM	64	4096	64	4096
8						
9	Co-Channel Interference Ratio	dB	34	49	34	49
10						
11	Rx Threshold	dBm	-70	-55	-70	-55
12						
13	RSL	dBm	-40	-40	-40	-40
14						
15	Harmful Int Threshold	dBm	-101	-101	-101	-101
16						
17	Catastrophic Int Threshold	dBm	-74	-89	-74	-89
18						
19	Access Point EIRP	dBm	30	30	30	30
20						
21	Victim Ant Gain	dBi	38	38	38	38
22	Attenuation Towards AP Degrees (See Antenna RPE Figure 3)	dB	0	0	60	60
23	Gain Towards AP	dBi	38	38	-22	-22
24						
25	Path Length	Miles	0.1	0.1	0.1	0.1
26	Free Space Path Loss	dB	92	92	92	92
27	Addl Loss Not to Exceed Interference Threshold (Bldg. Blockage/Longer Path)	dB	77	65	17	5
28						
29	Figure 1					

Figure 1 shows that an LPI device within a building close to a Licensed Victim Receiver will need between 77 dB and 17 dB of building loss not to exceed the Harmful Interference threshold at any angle around the Licensed Receiver. In order not to exceed the Catastrophic Interference threshold at any angle around the Licensed Receiver, it would need between 65 dB and 5 dB.

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Examples of Harmful & Catastrophic Interference Caused by a Very Low Power (VLP) Device

	VLP Unlicensed Device				
151120190		Victim's Main Lobe Interference		Victim's Back Lobe Interference	
Typical Values		Harmful	Catastrophic	Harmful	Catastrophic
Freq	GHz	6.1	6.1	6.1	6.1
Modulation	QAM	64	4096	64	4096
Co-Channel Interference Ratio	dB	34	49	34	49
Rx Threshold	dBm	-70	-55	-70	-55
RSL	dBm	-40	-40	-40	-40
Harmful Int Threshold	dBm	-101	-101	-101	-101
Catastrophic Int Threshold	dBm	-74	-89	-74	-89
Unlicensed VLP Device EIRP	dBm	14	14	14	14
Victim Ant Gain		38	38	38	38
Attenuation Towards AP (See Antenna RPE Figure 3)	dB	0	0	60	60
Gain Towards AP	dBi	38	38	-22	-22
Path Length	Miles	0.1	0.1	0.1	0.1
Free Space Path Loss		92	92	92	92
Addl Loss Not to Exceed Interference Threshold (Longer Path/Path Blockage)	dB	61	49	1	-11

Figure 2

Figure 2 shows that a VLP device will exceed the Harmful Interference Threshold at all angles around a Licensed Victim Receiver, and will need up to 61 dB of additional Path Loss not to exceed the Harmful Interference Threshold of a Licensed Victim Receiver at any angle.

Figure 2 also shows that a VLP device will Exceed the Catastrophic Interference Threshold at all angles within +/- 90 degrees around a Licensed Victim Receiver antenna's main beam, and will need up to 49 dB of Additional Path Loss not to Exceed the Harmful Interference Threshold of the Licensed Victim Receiver at any angle.

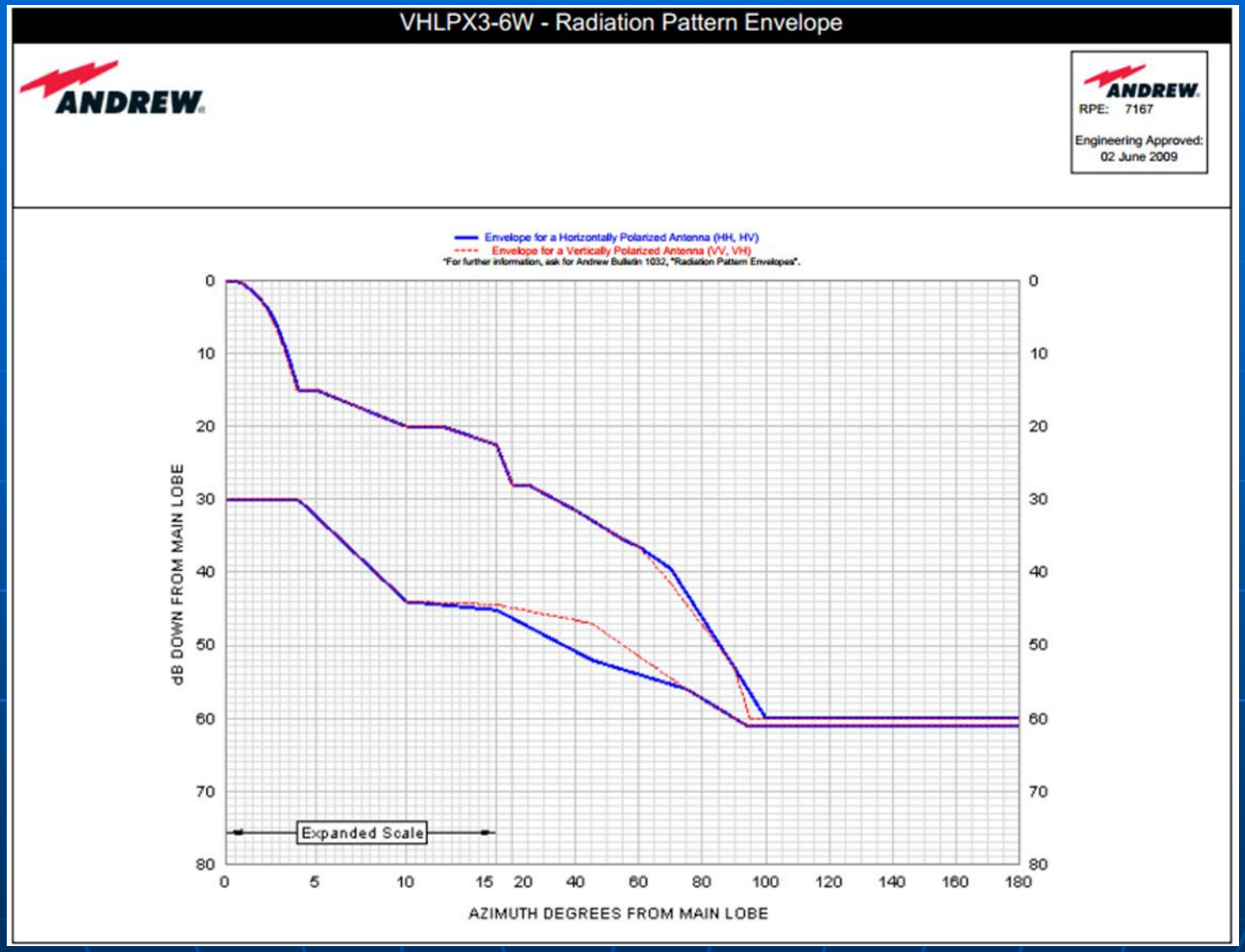
VHLPX3-6W - Radiation Pattern Envelope
ANDREW
ANDREW
RPE: 7167
Engineering Approved:
02 June 2009
Envelope for a Horizontally Polarized Antenna (HH, HV)
Envelope for a Vertically Polarized Antenna (VV, VH)
*For further information, ask for Andrew Bulletin 1032, "Radiation Pattern Envelopes".
dB DOWN FROM MAIN LOBE
0
10
20
30
40
50
60
70
80
Expanded Scale
0
5
10
15
20
40
60
80
100
120
140
160
180
AZIMUTH DEGREES FROM MAIN LOBE

Figure 3